

§37. Improvement in CHS Data Acquisition and Analysis System

Takahashi, C., Okamura, S., Yamada, H., Nishimura, K., Matsuoka, K., Kannan, K.L.*, Greenwood, D.*

(Oak Ridge National Laboratory)*

I. CHS Data acquisition and Analysis System (DAS) consists of six computer systems (PDP11×2, MicroVAX, VAX6310, ALPHA×2) that are used for data acquisition, analysis, graphics and data storage. New computer system (ALPHA Server 2000) was installed for data acquisition and data analysis, because the data from CHS diagnostics were more than 12Mbyte/shot (1.2Gbyte/day). The system has 128 Mbyte physical memory and 2.4 Gbyte magnetic disk of 64 bit standard length, and data acquisition becomes simple according to this system. Old computer systems are connected directly to CAMAC interface; the new system is not directly to CAMAC interface, but directly to VME memory modules. The block diagram of new data acquisition system is shown Fig.1. Experimental data are sent to VME memory through CAMAC module by way of VME control module. This method has the following two advantages compared with the old computer system.

(1) When the operating system is running under multi task and multi user, the CAMAC system can not operate real time processing for data acquisition, but this new method can do it because the CAMAC system is controlled by VME controller which is executed by operating system of the single task and single user. We can execute the data acquisition process under the minimum overhead on this operating system.

(2) This data acquisition system consisting of CAMAC and VME does not interrupt the new computer, then the

new computer does not need execute for exceptional condition.

The experimental data are stored in VME memory module per one shot and the new computer searches new data in VME memory module shot by shot. The new computer reduces the load of the system by this architecture. This acquisition system will be continued to develop in the next year.

II. New DMG (Data Management System) was introduced from ORNL and was modified for 64 bit standard length computer of CHS this fiscal year. We have used DMG on 32 bit standard length computer for data analysis and storage since 1991 (See annual report April 1991-, page 180). This 64 bit computer system was introduced for data analysis in last year, because as mentioned above capacity of diagnostic data per one shot became very large. Now we can read the DMG data in 32 bit computer from 64 bit computer by way of network. DMG has been executed under the distributed data processing by two computer systems. In this way we can reduce the load of 32 bit computer system.

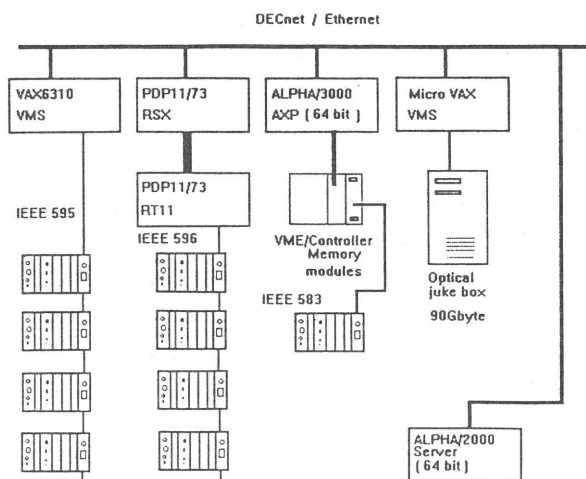


Fig.1. CHS Data Acquisition and Analysis System (DAS) configuration.